project WEB

Winter 2008

Connecting Projects WILD, WET and Learning Tree in New Hampshire

Linking Science and Literacy

This issue of Project WEB is devoted to inspiring more teachers and educators to make the natural connection between science and literacy in their own practice.

For many teachers today, literacy blocks seem to fill most of the school day, leaving little room for science. All too often, science is relegated to the last time slot of the school day, and after unforeseen circumstances arise, it is sometimes passed over altogether. With all that teachers are asked to cover in a single day, they need to look more than ever before, to teaching in an interdisciplinary way. Fortunately, there are many links between science and literacy, and this is especially true when using the local environment as inspiration.

According to Nancy Chesley, Elementary Science and Literacy Specialist with the Maine Mathematics and Science Alliance, reading and science are similar in many ways:

- Both engage students in investigations;
- For teachers, both need a rich and compelling context in which to teach the content, skills, processes and strategies;
- Both emphasize intellectual processes such as observing, classifying, predicting, etc.;
- Both are designed to help students construct understanding;
- Both are designed to help students monitor their learning; and

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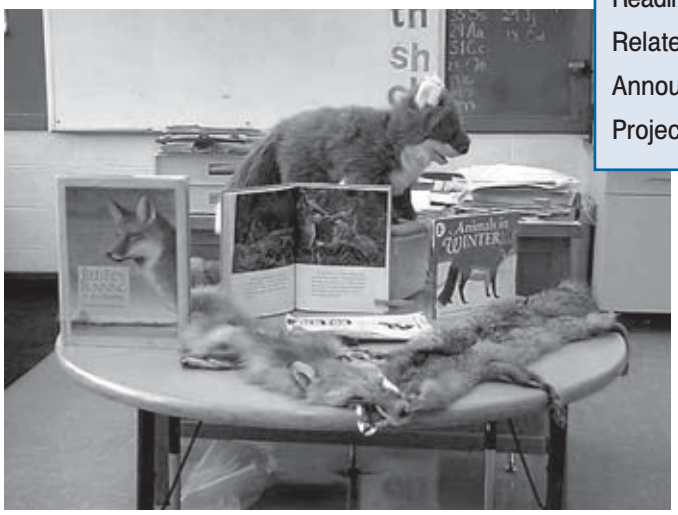
"I know in our team especially, we've made sure that when we're doing [natural science] we carry it over to the books that we're reading. We talk to the librarian, we talk to the art teacher, and say 'look we're doing a plant day, we're looking for any kind of resources, books, video, hands-on, whatever we can tie in."
~Teacher, Woodsville N.H



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Reading in the science content area is a way to improve literacy.

IN THIS ISSUE

A Natural Connection

By Meredith Bird Miller

What specific study fosters the skills of observation, analysis, evaluation, hypothesis, application through experimentation, re-evaluation, synthesis and communication? Is it primarily science? Could it be language arts? Perhaps it is art? In reality, these skills are most fully developed and expressed through the interplay of all of these disciplines, or content areas.

All of the skills described above are necessary to scientific, literate and creative thinking. By using interdisciplinary thought and teaching, we are promoting inquiry and learning; by thinking in such metaphorical ways, we actually inspire many more new ideas than we do if we are operating within only one framework of thought.

Before we can create ideas in any discipline or content area, we need to ask questions. Two unifying questions guide innovative thinking: "What else does this remind me of?" and "What else does it look like?"

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Extra, Extra – Read all about it!

The Project WILD Aquatic activity, *Aquatic Times*, affords a great opportunity for middle school teachers to integrate a language arts project with science, using the local environment. In *Aquatic Times* students investigate, write and produce a newspaper that features aquatic information and issues.

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Writing in the outdoors inspires young students.

Newspaper production requires an array of skills that include layout and design, writing, composition, research and decision-making. It also incorporates technology, as students commonly use tape recorders, cameras and computers, for writing and layout. In addition, students producing a newspaper have the opportunity to hone telephone skills and practice interview techniques, as well as research a variety of sources, including library resources, the Internet, magazines and topic experts.

The theme of the student-produced newspaper in *Aquatic Times* is aquatic environments, which includes the animals and plants that are found in them, aquatic habitats and related concerns and issues. To start the activity, teachers may want to introduce an actual newspaper as a model, and talk about the various parts of a newspaper. They can help students recognize that in addition to news articles, other sections exist in most newspapers, including comics, sports, editorials, employment listings, food, entertainment, business, advertisements and weather.

Students may be encouraged to include some serious articles, along with some that are more humorous. Examples of different types of stories might be entitled, "Water Strider Upends at Soap Spill in Stream," or a more serious title could read, "Crayfish Dies in Silt Avalanche." A sports story headline might read, "Fish Race to Spawning Beds," or an advice column could start with the salutation, "Dear Abolone." Once layout is complete, the paper could be printed, with a copy given to each student. If desired, distribution could include the entire school and even extend into the community.

Producing a student newspaper focusing on aquatic environments would target several of the New Hampshire Frameworks for both science and language arts, and has the potential to be a fun and invaluable learning experience. WEB

NATURAL CONNECTION continued from page 1

All artists, writers and scientists ask themselves these questions, but they may not do so at the conscious level. Einstein developed his theory of relativity by observing a train in motion and musing about its relationship to the speed of light; using analogy, he developed one of the major theorems of all time (Reuf, 2003). Robert Frost alluded to choices of his own life in one of his most famous poems (if not his most famous): "Two roads diverged in the wood and I…I took the one less traveled by…And that has made all the difference."

As an educator of future teachers, I am privileged to work with dedicated students who hope to engage and encourage young learners. We explore specific learning strategies and research in the education field and apply these in our college classrooms and in our local partner schools.

Imaginative links between science and literacy are used purposefully and engagingly in energetic teaching. By "making books," recording our scientific observations in written, graphic or artistic forms, telling traditional tales incorporating natural themes or tales of scientific discoveries and researchers, reading excellent children's trade books together, formulating questions and interacting through group research and discussion, we are developing our future scientists for participation in the real world.

Recently, my undergraduate students worked in sixth grade classrooms to promote vocabulary development. They integrated literacy and science by first designing lessons based on the current science curriculum. Working as a group of storytellers, they told Native American tales contextually related to the curriculum and then followed this up with a variety of vocabulary strategies to assist students in learning new words meaningfully. Some classes created "word bank cards," others played "pictionary," and most created "word webs." Not only did these lessons engage the children, they engaged their classroom teachers, many of whom hope to use some of the strategies we incorporated with their students.

One of my favorite interrelated science/literacy lessons involves a hand lens, a natural object and students' imaginations. By focused observation on the details of a sea star, for instance, and by connecting these details to prior experiences, students are able to create poetry while developing new realizations about function and form. Not only do they create poetry, they also create a visual representation of the sea star through detailed drawing.

In the lesson I have just described, again, it is the unifying questions the students ask themselves that drive the simultaneous processes of observing, analyzing, hypothesizing (questioning), applying and communicating through the integration of science, literacy and creative expression.

If we choose "this road less traveled by" in our teaching, we will nurture active learning in all areas of the curriculum, particularly in science and literacy, and this may make "all the difference."

Resources: Ruef, Kerry. The Private Eye®: (5X) Looking/thinking by Analogy. The Private Eye® Project: Lyle, Washington. (2003).

Meredith Bird Miller is Assistant Professor of Education at New England College. She teaches undergraduate and graduate level literacy courses, and Science in the Schools, K - 8. A doctoral candidate at Antioch University NE; she is researching global environmental change and its relationship to science/literacy education by examining traditional environmental knowledge inherent in story. WEB

Spotlight on...

New Project WET Coordinator

After three years as the New Hampshire Coordinator for Project WET, Jessica Morton is moving on. Jessica has been the Project WET Coordinator at the Department of Environmental Services (DES) since 2004. In the fall of 2007, she moved into a new position as an indoor air quality inspector at DES.

Taking over as the new Project WET coordinator is Alicia Carlson, who has worked at DES for over seven years as an Environmentalist. Alicia holds a Bachelor of Science in Environmental Biology from Plymouth State University and an Associate of Arts in Liberal Arts/Environmental Studies from Paul Smith's College in New York. In her years at DES, Alicia has participated in many educational events, including Make a Splash! with Project WET and the Drinking Water Week Festivals. Recently, Alicia was charged with coordinating and organizing educational events for the Biology Section of the Watershed Management Bureau.

Alicia was trained as a Project WET facilitator over four years ago and is familiar with many WET activities. She is looking forward to working with teachers around the state. Alicia can be reached at (603) 271-4071 or *alicia.carlson@des.nh.gov*.

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Alicia Carlson

Stories Provide and Expand on Experience

Ideally, environmental education begins with fingers in the soil, toes touching water, ears tuned to rustling leaves and eyes alert for the subtle and magnificent. As a child, I spent hours and hours playing in the woodland behind our house. A creek ran through it, and I loved walking through moss, thrilling at the slippery sliding, examining creatures, noting how the stream claimed the soil around it and exposed the roots of trees that clung to its sides. I lay on my back and watched birds and squirrels. I followed tracks, searching for (and occasionally finding) more elusive animals.

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A winter observation becomes the basis for "My Winter Animal Book."

My time in the woods helped me learn to take joy in the land. So, too, did explorations outdoors with my father, an accomplished and fervent naturalist. I cherish memories of catching a rat snake or hiking into the Davis Mountains with only a topographical map and my father's acute eye as guides. He noticed everything and could tell me about everything he noticed. He taught me to see — in detail and with an impassioned eye — just as he had been taught by others when he was a child. Not all children — perhaps fewer and fewer in these days of closely managed schedules — have such a combination of free and guided experiences. Good teachers know the importance of experience and relationship in learning, and so seek to "push back the walls" of the classroom to allow for such engagement. Stories are powerful allies in fostering engagement with the environment. While there is a wealth of informational literature that addresses the environment, and all texts provide experience, stories transport us, engage us more fully in this experience. Peterson and Eeds tell us that stories are explorations and illuminations of life[1]. We cannot help but engage in storytelling, as this is how, throughout history, we have created and maintained our sense of the world and our place in it. Stories are the very essence of the human experience. Rich stories that offer layers of thought and experience to be explored again and again have a unique power. Children come to live in such stories and, through them, to consider more deeply, to experience more richly, to be touched more profoundly. Like the informal narration of an interested and caring mentor who points out, explains, connects, and clarifies, an author's carefully crafted story can enrich our connections with the Earth.

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[1]R. Peterson and M. Eeds. *Grand Conversations: Literature Groups in Action*, Scholastic, 1990.

Excerpted from "The Power of Stories" by Sue Christian Parsons; taken from Teaching Green: The Elementary Years, *edited by Tim Grant and Gail Littlejohn, published by New Society Publishers, 2005.*

Reading with PLT

To create a better future for our children, let's help them connect with their wild roots

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Reading stories about the local environment engages students in learning.

Project Learning Tree supports the important role that reading plays in the classroom. Activities accompanied by literature provide students with a meaningful way to expand their learning and imaginations, while providing educators with tools to address current education initiatives. Reading connections are a leading feature of this guide and include a variety of fiction and nonfiction books. The books listed at the end of each PLT activity were selected to assist teachers in meeting reading goals and to build upon concepts learned in the activities. Authors, titles, annotations, grade level recommendations and ISBN numbers are provided for each book.

Several PLT activities include a "read-aloud." Research tells us that reading aloud motivates children to want to learn to read, assists in vocabulary and language development, and increases content knowledge. Reading a story aloud also presents great opportunities for classroom discussions, role playing, shared readings, arts and crafts and singing songs. In these read-alouds, educators are given additional techniques for effectively expanding upon the reading with their students. In *Trees as Habitats*, for example, *Good-Night Owl!* is suggested as a read-aloud. Use of this book has been integrated into the activity and discussion questions have been added.

Read-alouds include stories for teachers to read aloud or for students to read to one another or to themselves, depending on their grade level. With these stories and the discussion questions provided in the activities, educators can introduce new vocabulary and concepts, expand on content knowledge, and assess student comprehension.

Educators may expand upon PLT's emphasis on reading through the following techniques:

- Students reading aloud to each other.
- Students reading additional books by authors from the "Reading Connections."
- Older students reading to younger students.
- Students writing new endings to the books or creating new stories.
- Students reading outdoors.
- Students selecting appropriate music to go with a reading.
- Students reading the "Reading Connection" books to their siblings, parents or grandparents.

Source: ***www.plt.org***. A full reading list from the PreK-8 guide can be found at ***www.plt.org/cms/pages/21_21_168.html***

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Teaching Nature Journaling and Observation

By Clare Walker Leslie


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Students work on nature journaling.

The nature journal is not a new phenomenon in the history of scientific study, or for that matter, in the history of liberal arts education. It springs from an ancient tradition of record keeping: tribe, village or parish records; farming ledgers; native people's accounts of seasons and hunts; records of scientific expeditions; travel journals; accounts of investigations by self-taught naturalists; units of study in rural schools.

Luckily it is not really necessary to draw well in order to teach nature journaling.

The heart of nature journaling is the learning of observation skills, rather than drawing skills. Even beginners soon sense the usefulness of creating a visual record of their observations. The following are some suggested exercises:

1. Students take out their journals. On the top of a blank paper, they put the date and their name.
2. Below the date, they write where they are. Ask them to consider why place is important to a record when setting up a study.
3. They note the time of day.
4. They write down the present weather (temperature, barometric pressure and length of day may also be included).
5. Take the students outdoors, in silence. Ask them to listen and write down three sounds under the heading, "I hear…" Then ask them to write a brief stream of consciousness sentence or poem.
6. Looking at the ground, the students should find three contrasting leaf shapes, either of groundcover plants or fallen leaves. Use simple line drawings and label the size, color and key feature of the leaf, as well as the name of the plant if they know it. Each drawing takes no more than two minutes.

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Water You Reading?

By Jessica Morton

Have you tried teaching science through reading? The Project WET International Foundation suggests using the Project WET Activity & Curriculum Guide along with the following children's books while teaching about the fundamentals of water in your classroom:

Spring Waters Gathering Places, by Sandra Chisholm De Yonge. This 80-page children's book is made up of five short, beautifully illustrated stories that chronicle the use of spring waters by the animal world, native culture, civil war, Oklahoma pioneers, and Teddy Roosevelt. Three sections follow with lessons about the water cycle, the creation of springs and our bodies' dependence on healthy water. Activities from the Project WET guide such as the *Incredible Journey*, *Get the Groundwater Picture*, *A Drop in the Bucket* and *Water Works* can be used in conjunction with reading this book.

The Rainstick - A Fable, by Sandra Chisholm Robinson. This 40-page children's book is about a young boy's quest for rain that takes him on a journey from the hot, dry savanna to the moist, comforting rain forest. You will encounter languid lions, a crafty crocodile and a brilliant bird on your way to discover the place of rain. Riddles, myths, history, traditions and an ancient instrument of West Africa are the inspiration behind the book. This enchanting story is enriched by full-color illustrations that bring the landscape of West Africa to life. Discover the wonder of rainsticks when you create your own with the easy-to-follow instructions provided. When you slowly turn your rainstick to the end, listen for the sound of rain. What stories do you hear? The activity The Rainstick from the Project WET guide can also be used in conjunction with reading this book.

If we all do our part, a cleaner, safer environment is indeed within our reach.

All the Way to the Ocean, by Joel Harper. This children's book is an uplifting story about two best friends, Isaac and James, and their discovery of the cause and effect relationship between our cities' storm drains and the world's oceans, lakes and rivers. It is sure to inspire both young and adult readers alike and teach a timeless life lesson -- if we all do our part, a cleaner, safer environment is indeed within our reach. The activities *A-Maze-Ing Water*, *Rainy Day Hike*, and *Sum of the Parts* can be used in conjunction with reading this book. Also, borrow an enviroscape model to learn more about watersheds (contact the N.H. Project WET Coordinator).

To order any of these books please visit the Project WET store at www.projectwet.org or contact the N.H. Project WET coordinator at ***wet@des.nh.gov*** or call (603) 271-4071 for more information.

RESOURCES

N.H. English Language Arts Framework Correlations Now Available!

Project Learning Tree, WILD, WET and HOME have recently completed the correlations of the programs to the New Hampshire English Language Arts Frameworks. They can be viewed, along with the latest science, math and social studies correlations, at the following links:

- **Project Learning Tree:** *www.nhplt.org/Correlations.htm*
- **Project WILD:** *http://wildlife.state.nh.us/Education/project_WILD.htm*
- **Project WET:** *www.des.state.nh.us/wet/correlations.htm*
- **Project HOME:** *www.wildnh.com/Education/ed_project_HOME.htm*

Do you have an idea for a topic the WEB should address? If so, please contact Erin Walsh at (603) 226-0160 or *info@nhplt.org.*

Activities Related to Articles in This Issue

Project WILD suggests:

Students create journals in *Wild Words*, then compare their entries to journals of naturalists they researched.

And the *Wolf Wore Shoes* spells out the differences between real and imaginary animals and their characteristics in children's books.

When they analyze three literary selections about bison in *Prairie Memoirs*, students interpret different cultural viewpoints and evaluate cultural factors leading to the endangerment of a species as they learn how wildlife and its habitat affect cultures and societies.

Project Learning Tree suggests:

In *Earth Manners*, students will hear the story Trapper by Stephen Cosgrove and Robin James and express their own rules for proper manners when outside.

In *Tale of the Sun*, students will develop an understanding of how groups of people, or cultures, used stories to explain natural occurrences around them.

In *A Look at Lifestyles*, students will compare their own lifestyles with those of traditional American Indians and early pioneers.

Project WET suggests:

In *Adventures in Density*, students conduct investigations to discover how the density of water is affected by heat and salinity, and relate their discoveries to literary adventures.

Using a global map and a set of clue cards, students will locate *Great Water Journeys*.

Students will participate in a *Water Crossings* contest in which they must move their possessions (a hard-boiled egg) across a span of water (a cake pan).

ANNOUNCEMENTS

Project WILD and WILD Aquatic

Saturday, March 15, from 9 a.m. to 4 p.m., at N.H. Fish and Game headquarters in Concord. Go WILD in your classroom using this activity-based, supplementary curriculum; a great resource for teaching wildlife and environmental concepts. Pre-registration required. To register, contact Mary Goodyear at *sidekick@ncia.net*; call 603-419-0256; or visit *www.wildlife.state.nh.us/education/ed_calendar.htm*.

Environmental Pathways in the Classroom: PLT, WET, and WILD

Saturday, March 8, from 9 a.m. to 5 p.m. at Fox State Forest in Hillsboro. Introduces educators to the award-winning curriculum materials of Project Learning Tree (PLT), Project WET, and Project WILD. Designed to take forests, wildlife, and water and make them real for preK-12 students. Activities are easily infused into everyday school subjects and busy classrooms and are aligned with national and state curriculum frameworks. Workshop fees are $50 pre-service teachers and $75 in-service teachers. Pre-registration required. To register, go to *www.nhplt.org* or call 603-271-0160.

New Hampshire Environmental Educators (NHEE) Annual Conference

The NHEE conference is set for Wednesday, March 12 (snow date March 13) from 1 – 8 p.m. at the NH Audubon McLane Center at Silk Farm in Concord. The theme for the conference is Changing the Face of Science Education – how the new science frameworks are changing science instruction in New Hampshire schools, and how formal and non-formal educators can work together to meet the Science literacy frameworks. Attendees will explore the frameworks and hear success stories from educators working to improve science literacy in New Hampshire.

NAI Region 1 Conference

The National Association for Interpretation (NAI) Region 1 is hosting a spring conference, Surviving Fiscal Hard Times: Creative Interpretation Under Budgetary Constraints, March 31–April 2 at the Rowe Camp and Conference Center in the heart of the Berkshires of northwestern Massachusetts. For further information about the conference or to register, visit *www.nairegions.org/1/2008Workshop.pdf*, or contact Mary Goodyear, N.H. Fish and Game, at *sidekick@ncia.net* or call 603-419-0256.

Discover WILD New Hampshire Day

April 26 from 10 a.m. to 3 p.m. This outdoor festival is a fun day of hands-on, educational family activities at N.H. Fish and Game headquarters at 11 Hazen Drive in Concord. Free. Co-sponsored by N.H. Fish and Game and the N.H. Department of Environmental Services. For information, call (603) 271-3211 or visit the Fish and *www.WildNH.com*.

NH Children in Nature Coalition

Following the November 2007 Leave No Child Inside forum, there is a new initiative to reconnect children and nature called the N.H. Children in Nature Coalition. To find out more, or to get involved, visit *WildNH.com/ChildrenInNature*.

Spring Secondary Series with PLT

This series is designed for N.H. educators working with students in grades 6-12. The workshops will use three of PLT's secondary modules, with activities that address social studies, geography, civics, language arts, health, math and science concepts. Each session will be from 3:30 – 6:30 p.m. and include a pizza dinner. Costs are $35 for one session or $60 for the two sessions. To register, call 603-226-0160 or visit *www.nhplt.org*. The two sessions are:

- **April 8 – Exploring Environmental Issues in the Places We Live:** Provides opportunities for students and other community members to conduct educational investigations focused on how local environmental issues are linked to social and economic changes and influence community character.
- **April 15 – Exploring Forest Ecology and Forest Issues:** In *The Changing Forest: Forest Ecology* module, students examine ecological systems of a forest, analyze interdependencies within a forest ecosystem, and explore factors that shape the development of forests. The *Exploring Environmental Issues: Focus on Forests* module uses forest-related examples to help students better understand the complexity of environmental issues.

2008 NH Drinking Water Week Festival

The New Hampshire Drinking Water Week Coalition will hold its annual Drinking Water Week Festival on Wednesday, May 7, at the Massabesic Audubon Center in Auburn, N.H. Local fourth grade classes in Manchester are invited to attend at no cost. The festival includes a theatre performance, hands-on water activities and the 4th grade water science fair finals. For information, contact the N.H. Project WET coordinator at 603-271-4071 or *wet@des.nh.gov* or visit *www.des.nh.gov/dwgb/waterfest*.

Watershed Ecology: Summer Course for Science Teachers and Community Leaders

Two-week course (Monday through Friday) offered July 21-August 1, from 8:30 a.m. to 4 p.m., at Bow High School. Watershed ecology is an undergraduate and graduate-level summer program geared to science educators and community leaders. Coordinated by staff from the N.H. Fish and Game Department, the course offers techniques for applying science in real-world situations. Each day, specialists focus on a different aspect of watershed ecology. Hands-on, experimental learning is emphasized in both field and classroom settings. The course can be taken for 2 credits from the UNH Division of Continuing education or as a non-credit course. Contact Judy Tumosa, Fish and Game Aquatic Resources Education Coordinator at 603-271-3212 or email *judy.l.tumosa@wildlife.nh.gov*.

Forest For Every Classroom

A Forest for Every Classroom (FFEC) is a year-long professional development series for middle and high school educators, aimed at providing the inspiration, knowledge and skills required to transform classroom teaching into effective and exciting place-based education. Teachers who participate in FFEC develop their own curriculum to increase student literacy skills and foster student understanding of – and appreciation for – the forested lands in their communities. These curricula integrate hands-on study of the natural and cultural resources of the local community, addressing concepts in ecology, sense of place, civics and forestland management and stewardship. The 2008-09 session will begin in August 2008, so please look for more information and the 2008-09 brochure at *www.nhplt.org*.

ON THE

H.O.M.E. FRONT

Literacy in the Outdoor Classroom:

Ways and Places for Teaching Science through Reading

by Marilyn Wyzga

One of my favorite places to read is outside. It's been like that since I was a kid, sitting up on the roof of our house or on the branch of the big maple in our backyard. It was like having a window into the two biggest worlds open at once: the world of imagination, and the world of view.

With a schoolyard habitat, your students can read in the landscape, and can also read the landscape. More than a wealth of habitat resources to satisfy the needs of wild creatures, a schoolyard habitat – when thoughtfully designed – also creates an interesting and engaging outdoor learning space, and expands literacy.

There are places to read: knolls and nooks, boulders or benches. I've seen outdoor classrooms that include unique seating for children who want to sit and talk or gaze or read – chairs shaped like butterflies, benches built of bent wood and branches, and artfully sculpted seating designated as "storyteller" chairs.

There are also ways to read. Project HOME guides student investigation of the schoolyard landscape, from collecting first impressions to compiling records of specific data like animal tracks. This long-term inventory process offers various ways to incorporate language arts into the outdoor classroom. Two HOME inventory cards specifically address reading the landscape and writing a response: "25 Words" and "On the Spot Story."

Then there are words to read. A number of children's books are ripe with possibility for engaging children and youth in the outdoors with an eye towards an outdoor classroom. Here are two of my favorites:

The Salamander Room, by Anne Mazer

In rich pictures and descriptive text, Mazer relays the conversation between a mother and son about how the boy will create a room for a salamander he's brought home. For young children, this story – read aloud by the teacher – introduces the concept of "habitat" and allows them to explore what it is we all need to survive. This can lead into discussion about the differences between wild and domestic animals, and whether we humans need to provide habitat for the wild ones. (Themes and concepts also connect to Project WILD activities, "What's Wild?" and "The Beautiful Basics.")

Once the little boy considers what the salamander needs to live, the story expands to include what those things need to live, and so on, until he has conceived a complete mini-ecosystem in his bedroom. Older elementary students can grasp and explore the ecosystem concept and a study of food webs. They can also read the book, then conduct research to assess its accuracy. Is a salamander "warm and cozy"? Would a wild animal "miss its friends in the forest"? Would a salamander like "shiny wet leaves and water," or tree stumps "so he can climb up the bark and sun himself on top"? Why?

The ending of this charming tale has the boy outside, sleeping under the trees and the stars, which may well be where your students end up once you've engaged them in the outdoor classroom and connected them with nature.

One Small Square: Backyard, by Donald M. Silver

The One Small Square resource books – each volume dedicated to a different environment – encourage the upper elementary reader to investigate all layers of the landscape contained in a small plot. The books themselves visually convey the concept; each measures 8 x 8 inches and has a ruler running around the four edges. In the Backyard volume, this exploration travels from plants down to animal tracks and into the earth to find soil dwellers.

At the outset, Silver presents a recommended list of tools, instructions for designating a "one small square" study plot and directions for making a backyard notebook in which to write and draw observations. The book then follows a seasonal progression, guiding the reader through hands-on inquiry and discovery. The section titled "Out in the Cold" fits perfectly with this season: "On the first cold day of the year, out come your scarves and gloves, sweaters and hats. But for backyard plants and animals, it may be too late to protect themselves from the harmful effects of frost. To avoid being weakened or killed, they have to prepare ahead for the time when water turns to ice." What follows is an inquiry into galls, snow fleas and tree buds.

Every New Hampshire schoolyard has at least one square foot of soil, and more than likely has enough for each student or pair of students in a class to have an area roped off to study. So it's a feasible, long-term, inquiry-based schoolyard investigation. This kind of in-depth exploration really sets the stage for the Project HOME activities mentioned earlier, which build these observations into a writing exercise through which the students tell the story of their schoolyard landscape.

I remember doing this back in seventh grade, using a small field that abutted our school's paved parking lot. For a year, we looked and counted and drew and recorded the changes to our plots. This exploration was the inspiration of the same teacher who took us on our first class trip to a residential environmental center in northern New Jersey. That experience profoundly affected my life and influenced my career. And the last I heard, that teacher is still taking classes up to Stokes State Forest to read the landscape and learn in the outdoors. WEB

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7. Looking at eye level, ask the students to draw three objects they see at eye level.

8. Draw leaves, using blind contours. Ask students to sit down in a ring and pick up one leaf to draw. They have to look at it very carefully, turning it in various positions, so to try to really see it well. Then, without looking at their paper, and without lifting their pencil once, they draw the whole outline, all the veins within, and any insect nibbles.

9. Drawing a tree, using blind contour. If the class has never drawn a tree before, suggest trying to do a blind contour first. The act of doing a blind contour forces five-year olds and fifty-five year olds alike to see a tree as the tree is, not as they think it is. I find it the fastest and best exercise to get any student drawing, no longer frozen in fear and frustration.

10. The full landscape: If there is time, have students draw a 3-by-5 or 6-by-7-inch box and in it draw a shape map of the landscape in front of them. The steps are as follows:

- Begin with the top of the trees, or mountains, or water, as it meets the sky. Draw a line where the sky and land meet.
- Drop down to the bottom of that vertical land mass and draw where trees and ground meet.
- Using simple images, draw in the trees, buildings, cars, or whatever you see within the view in front of you.
- Label what you draw and write any other topical information underneath such as location, time of day and weather.

11. Along the way: While a class is drawing, unexpected events may occur: rabbits hop by, a crow screeches into a tree, perhaps a hawk swoops past or even an owl. I always tell the students to stop whatever they are doing and quickly sketch what may vanish. I often yell out, "Draw now! Identify later."

Excepted from the essay "Teaching Nature Journaling and Observation" from the book *Into the Field: A Guide to Locally Focused Teaching*, published by the Orion Society. For ordering information, contact The Orion Society at 888/909-6568 or visit ***www.orionline.org***.

Claire Walker Leslie is a nationally recognized wildlife artist, naturalist, educator and the author of Keeping a Nature Journal, The Art of Field Sketching, Nature Drawing: A Tool for Learning *and many other books. She has taught nature journaling and field sketching for more than 25 years.* WEB

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- Both help students bring together information from different sources to make judgments and draw conclusions.

Some New Hampshire schools are already realizing the benefits of the science and literacy connection. During N.H.Project Learning Tree's Connecting Schools to People and Place (CS2P) program at Woodsville Elementary School in Woodsville, N.H., natural science became embedded into the school's curricula through the window of its existing literacy program. Because of this, Woodsville teachers quickly began seeing a difference in their student's attitudes towards reading and writing. WEB

Coordinator Information

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